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**Article**

# Influence of Accurate Pronunciation on Correctness of Spelling in Written English

— Does Accurate Pronunciation Lead to Correct Spelling? —

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## Keywords

borrowed words, Katakana, word recognition, word familiarity, phoneme

## I. Introduction

A word is the smallest unit of any spoken language. There are however many languages in the world that do not have a written script. Of those that do, but don't share the Roman alphabet, rules for writing are vastly different. For example, in contrast to Japanese Kanji that needs to be drawn in a definite stroke order, it is indispensable that spelling of words be correct in written English. If misspelled, word recognition itself is hampered and readers might need to re-read the whole sentence to understand the misspelled word. A study by McConkie and Zola (1981) revealed that readers' eye movement pattern was disrupted when they saw misspelled words. Correct spelling is the essence of written English so learning to spell becomes a crucial part of English language learning.

Spellings are alphabets that must be written in a prescribed sequence to

make a word. Remembering a set of different alphabets for each word could be a serious challenge for students learning English as a second language. Furthermore, many sounds that exist in English may not exist in students' native language so written expression of those sounds becomes impossible unless the pronunciation is deviated from the original. But doing so may drastically change how a word may sound when pronounced. A good example of this is common in case of Japanese. Although a separate script called Katakana is intended especially to make written expression of words borrowed from other languages, it fails to express certain English half sounds as in “taxi”, “school”, “floor” etc. Understanding this limitation or shortage of means to express foreign sounds in written Japanese is very important because Japanese students tend to spell English words the way they would write in Katakana.

While a unique sound is associated with each of the 26 alphabets in English, combining these sounds to form a word can result in a sound so different that it raises the risk of misspelling it. According to Ehri (2000) who studied how reading and spelling are related, spellings are targets of two basic literacy acts involving words: 1) reading spellings to determine their pronunciations and meanings, and 2) spelling spellings by writing them. He also points out that the amount of information to be drawn from memory is greater for spellers who must produce multiple letters correctly sequenced than for readers who must produce single pronunciations and meanings for written words.

In such a scenario, is memorizing the best way to learn spelling? Could accurate pronunciation help lead to correct spelling? According to Ehri (2000), the memory required to spell English words accurately exceed the memory required for reading. In this investigation, we examined whether accurately pronouncing a word can lead to writing its correct spelling. We also discussed how students may overcome hurdles of learning the spelling of English words.

## II. Method

### i. Subjects:

More than a 100 university students who are learning English as a second language participated in this study. A wide range of proficiency levels was represented. Japanese was the native language of these students. They were first year or second year students belonging to different departments at a private university in Japan.

### ii. Selection of words:

A total of 3 word lists were prepared and named 'A', 'B' and 'C.' Each word list consisted 10 words belonging to a specific category as shown in Table 1. Each category contained 3 words chosen to test a specific area with greater risk of being misspelled (underlined letters in Table 1). Following are reasons for selecting each category.

Table 1 Category of words with underlined letters as tested areas in each word list

No. of words	Category	A + A1	B	C
1	borrowed words	Rest <u>au</u> rant	Hand <u>ker</u> chief	Al <u>co</u> hol
2	m [m], n [n], r [r], l [l]	Contem <u>p</u> orary	Com <u>p</u> lain	Com <u>fo</u> rtable
3	ar/ir [aə], [ɜ]	F <u>ir</u> m	F <u>ar</u> m	<u>H</u> arm
4	cial/ -tial [ʃ]	Rac <u>i</u> al	Soc <u>i</u> al	Mart <u>i</u> al arts
5	or/ -er [ɜ]	Doct <u>or</u>	Invent <u>or</u>	Conduct <u>or</u>
6	kn (silent letter)	<u>K</u> nit	<u>K</u> nowledge	<u>K</u> nock
7	ch [tʃ]	<u>Ch</u> urch	<u>Ch</u> oice	<u>Ch</u> ocolate
8	double letter	Comm <u>un</u> ication	Empl <u>ee</u>	Traff <u>ic</u>
9	memory	Pron <u>u</u> nciation	Lett <u>u</u> ce	Wednes <u>d</u> ay
10	ph [f]	<u>Ph</u> ysics	<u>Ph</u> ysical	<u>Ph</u> ilosoph <u>y</u>

Day 1: Included writing the spelling of words in lists A, B and C.

Day 2: Included pronouncing the words before writing the spelling of words in list A.

Category 1 was selected because English comprises of many words that

are borrowed from other languages. Such words are often spelled with different vowels than the original word. To spell correctly, it is helpful for students to know the original root of these words. The underlined letter/s in category 1 is/ are not written as pronounced.

Category 2 was selected to test whether the students are able to distinguish the subtle difference of the sounds [n] and [m] and [r] and [l]. These mistakes are common among Japanese students. To spell them correctly, students must be able to distinguish it while hearing. Although the sounds [n] and [r] can be expressed in Japanese script, the sound [m] and [l] do not exist in Japanese and so these sounds should be recognized by students.

Category 3 was selected to test students for [ɛ:] and [a:] sounds, written in the same way in Katakana. They were also tested to distinguish the sounds [f] and [h]. Although these resembling sounds are confusing, students were expected to make the distinction by observing lip and mouth movement.

Category 4 was included to test whether students can identify sounds that are written with a different spelling but pronounced in the same way for example ‘cial’ and ‘tial.’ To spell these words correctly the students were expected to rely on memory.

Category 5 was selected to test students ability to recognize that not all verbs can be personified by adding ‘er’ and in some cases it is ‘or.’ For example, adding ‘er’ behind the verb ‘sing’ can mean the person who performs that action but a person who invents or conducts is followed with an ‘or’ instead. Furthermore there are words like ‘doctor’ not involving any verb.

Category 6 was selected to test students whether they can recognize words with a silent letter. Words with [n] sound but actually have the letter ‘k’; words that end with [dz] sound but spelled ‘dge’; words that end with [k] sound but spelled ‘ck’ as in ‘lock’, ‘duck’ etc. require dependence on memory rather than accurate pronunciation.

Category 7 was selected because the sound [tʃ] as in ‘church’, ‘chocolate’ and ‘choice’ could be pronounced as [k], as in ‘cholesterol’ but spelled with ‘ch.’ Pronunciation alone is not enough to spell these words correctly.

Category 8 was selected to test students for words with double letters. Clues to such double letters are not necessarily stressed or emphasized when pronounced. Students need to remember the spelling of these words.

Category 9 was selected to test students for words that have no specific reason why they are spelled the way they are. To spell these words correctly students may break down the word while pronouncing but they are spelled very differently than their pronunciation.

Category 10 was selected to test whether students can differentiate the sounds ‘fi’ and ‘phy’ or [s] and [z]. The sounds ‘fi’ and ‘phy’ sound similar so they are written in the same way in Japanese making it difficult to distinguish.

### **iii. Classroom procedure:**

Two days were allotted for this investigation with an interval of a week between them. On the first day (Day 1), students were asked to write spellings without pronouncing the word. A week after, on the second day (Day 2), students were asked to pronounce each word several times before writing the spelling.

On Day 1, students wrote words in list ‘A,’ after each word was repeatedly pronounced 3 times by the teacher. Soon after, students were divided into 2 groups. The first group was given word list ‘B’ and the second group was given word list ‘C’ (Table 1). Pronunciation was not pre-taught. Students were asked to pronounce each word as they normally would. They pronounced the words in their respective lists 3 times so that students of the opposite group could write the spelling.

On Day 2, a week after Day 1, students were asked to re-write the words

in list 'A'. However, this time, they were asked to listen to the teacher's pronunciation carefully. They were then asked to repeat each word 3 or more times before writing its spelling. Since data was collected by different teachers, word list 'A' was recorded to play on Day 2. The activity of writing spelling after pronouncing was called 'A1.'

### **III. Results and Discussion:**

i) Day 1: On this day, students had heard the pronunciation from the teacher or fellow students in opposite group and written the spelling without repeating the words. Out of 10 words, the average of correctly spelled words in lists A, B and C was 4.7, 6.3 and 5.9 respectively. When students spelled a set of words according to teacher's pronunciation, their score was lower than when they spelled another set of words according to fellow student's pronunciation. Hearing a fellow student's pronunciation was more effective to get the spelling correct than hearing the teacher's pronunciation.

Words that were misspelled by most students according to word list were "racial" (category 4) in 'A', "lettuce" (category 9) in 'B' and "alcohol" (category 1) in 'C.' Similarly, words that were correctly spelled by most students were 'doctor' (category 5) in 'A', 'social' (category 4) in 'B' and 'chocolate' (category 7) (Table 1). Since these words belonged to different categories, we refined the results by analyzing percentage of correctness for all three words belonging to same category (Fig. 3). Although the tested area was same in each category, a big variation was observed in the ability to spell all three words correctly. For example, in category 4 (racial-social-martial arts), just 6% of students could correctly spell 'racial' while 95% of students correctly spelled 'social' and only 21% of students correctly spelled 'martial arts.' Similarly, in category 5 (doctor- inventor-conductor), although 96.5% of the students could spell 'doctor', only 74% could correctly spell 'conductor' and just 48% could correctly spell

‘inventor’ (Fig. 3). In all data, while 96.5% of the students could spell ‘doctor’ only 3.5% of students could spell ‘lettuce.’ Somehow, words being in the same category did not relate with students’ ability to spell them correctly. Also, it is worth to highlight category 4 (racial-social-martial arts) because this category had the biggest variation in spelling ability (Figs. 2, 3).

When we analyzed some spelling errors in detail there were some interesting finds. Some students had written ‘late show’ instead of ‘racial’; ‘headache’ instead of ‘physics’ and ‘net’ instead of ‘knit.’ We thought that this kind of total deviation from the pronounced word deserves special attention since some students had written double words, like ‘late show’, instead of one. In our word list, ‘martial arts’ was the only word written as two words with a space between ‘martial’ and ‘arts.’ However, when pronouncing, ‘martial arts’ there is barely a long enough pause so it sounds like one word. When speaking English at normal speed, the pause after every word is shortened and some words are fused for example- ‘should have’ becomes ‘should’ve’ so a listener may not be able to separate words but when writing, a space is certainly inserted after every word to separate it from other words. This pausing while speaking and spacing while writing is important for word recognition. In case of the word ‘racial’, ‘r’ is confused with ‘l’, a sound that does not exist in Japanese. The phoneme [æ] is heard but the suffix ‘ial’ is not. Since the ending sound is a half sound and it is a non-existent sound in Japanese, only the ‘sh’ sound is heard as the final sound and hence ‘show’ might have been written as the second word. In their book, Avery and Ehrlich (1992) have mentioned that in case of [r] and [l] Japanese has only one liquid sound which is between the English [r] and [l]. In word-final position, Japanese speakers most often delete them. Japanese speakers’ pronunciation of English words and sentences may lack the vowel reduction necessary for English rhythm. Japanese does not have a short, reduced vowel equivalent to the English shwa.

On the other hand, why were 96.5% of the students able to spell ‘doctor’? Perhaps the students were familiar with this word. Ehri (1997) reports how pre-knowledge of a word’s meaning helps to read and write it. However, it seems word familiarity alone is not enough to correctly spell words because the word ‘lettuce’ (categorized 9) exists in Japanese as a borrowed word so students were familiar with the meaning of this word but only 3.5% of the students could correctly spell it. The main cause could be the deviation in pronunciation because, as a borrowed word, ‘lettuce’ is written and pronounced ‘retasu’ in Katakana script of Japanese.

ii) Day 2: On this day, students heard the teacher’s pronunciation of words in list ‘A’, pronounced the word themselves 3 or more times and then written its spelling. This activity was called ‘A1’ and did not include hearing fellow student’s pronunciation. We examined whether the number of correctly spelled words differed if students pronounced the word before writing its spelling. We found that activity ‘A1’ had a positive effect because correctly spelled words increased in all categories (Fig. 1, A & A1). The biggest increase was seen in the word ‘racial’ because students who spelled it correctly increased 3.7 times. Similarly, students who correctly spelled ‘physics’ increased 3.2 times, ‘firm’ increased 3 times and ‘knit’ increased 2.7 times. The activity ‘A1’ was performed a week after students spelled word list ‘A’. It is true that students were pre-exposed to the words so it could have helped them spell it correctly the second time. However, on Day 1, they were not taught the correct spelling even if they misspelled it. It was also believed that a week’s interval is a long enough time span to forget any new word the student heard for the first time.

On Day 2, it was expected that accurate pronunciation would help students to spell words correctly. Refined results show that students who had previously spelled ‘racial’ as ‘late show’ or ‘ratio’ or ‘leisure’ could distinguish

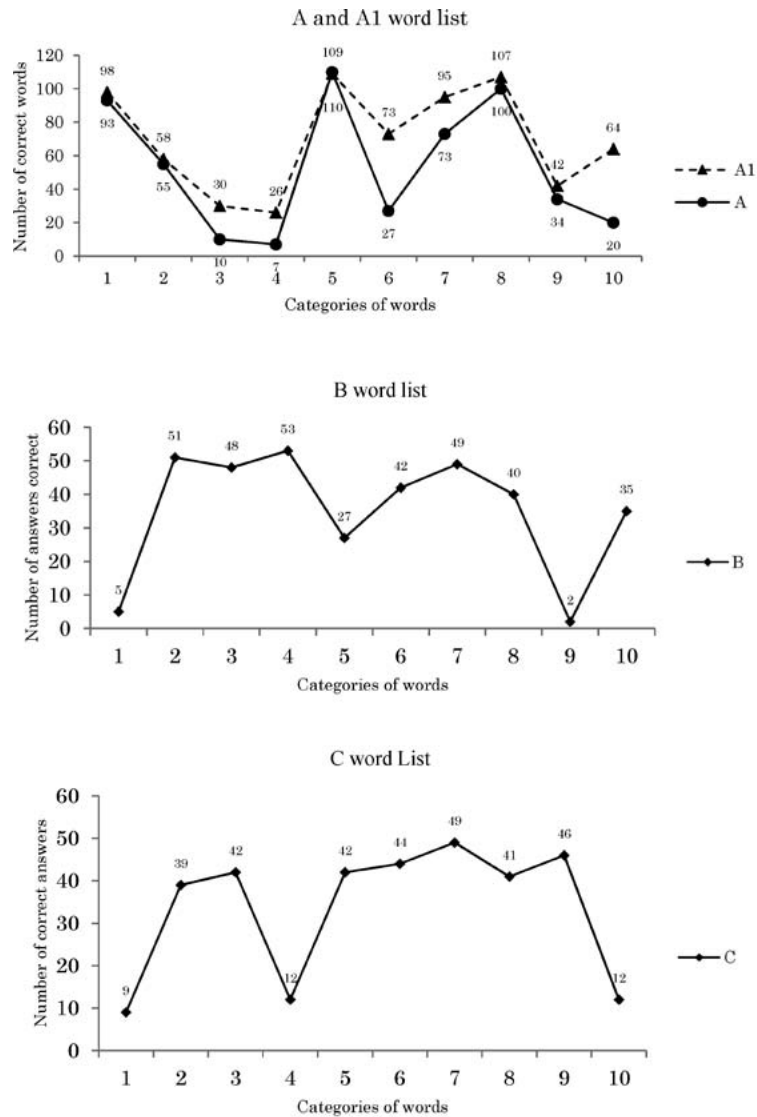


the correct sound while pronouncing the word. Students who had misspelled it as ‘ratial’ the second time were considered to have improved because they were closer to getting it correct. Learning to read words did not enable most students to spell the words perfectly because it is easier to read words accurately in English than to spell them and failure to remember one or two letters dooms a perfect spelling but not necessarily an accurate reading (Ehri, 2000). Students who had previously spelled ‘physics’ as ‘head ache’ or ‘fedex’ or ‘figix’ or ‘fizics’ had noticed that it is spelled with a ‘ph.’

Why might some students write [h] for a word that starts with [f] sound? To answer this question, some knowledge concerning Katakana is necessary. In Katakana, the vowels that follow the [h] sound are: ‘ha-hi-fu-he-ho’. It can be noticed that the only written alternate for the [f] sound comes in this row of Katakana letters so when the students heard the ‘fi’ sound, they replaced it with the closest alternate ‘he’. Understanding such details in the student’s native language might be very important to find how mistakes originate. The next word ‘firm’ was misspelled ‘farm’ because students tend to replace the sound ‘ir’ that is non-existent in Katakana with [a:] sound. However accurately pronouncing the word before writing helped students understand the difference at least to some extent and this might have lowered the tendency to spell it incorrectly. For students who misspelled ‘knit’ for ‘net’ or ‘nit,’ the need to add the letter ‘k’ is not reflected in the word’s pronunciation. Spelling words with a silent letter is not easy so there is a need to memorize it or be previously exposed to the word while reading. According to Ehri (1997), subjects who had studied the printed words judged significantly more of the sounds according to their spellings than control subjects who did not see the printed word. His findings provide evidence that spellings may have a distorting influence on readers’ perception of the sound in words because the spellings are interpreted as symbols for pronunciations and are stored in memory this way. If seeing the

word in print while reading improves spelling, perhaps the students were better exposed to the words ‘knowledge’ (with silent letters: ‘k’ and ‘d’) and ‘knock’ (with silent letters: ‘k’ and ‘c’) because 42 out of 56 students correctly spelled ‘knowledge’ and 44 out of 57 students correctly spelled ‘knock’ (Fig. 1, B). But in case of ‘knit,’ since the first letter is silent and students are exposed to ‘net’ as in ‘internet,’ if a student mishears the sound [ɪ] for [e], this could raise the chance of misspelling it. Data shows that only 27 out of 100 students correctly spelled ‘knit’ the first time. However after activity ‘A1’, 73 out of 100 students could spell it correctly. Drake and Ehri (1984) showed spellers how to create special spelling pronunciations in which sounds were assigned to letters not pronounced distinctively in normal spoken forms of words. According to them, it helps students if they create special spelling pronunciations that include the silent letters, for example, remembering ‘Listen’ as ‘Lis-Ten’ and pronouncing ‘Chocolate’ as ‘Choc - O - Late’. It was found that spellers remembered non-distinctively pronounced letters better if they practiced spellings this way than if they practiced dictionary pronunciations that did not make the letters distinctive in speech. However this strategy did not improve their memory for doubled letters-not surprisingly because pronouncing would not distinguish the doubled letters in memory. If we look at our data for category 8, writing after pronouncing did not make a huge impact and pre-exposition to the word seems to be the reason for getting it correct.

We noticed that words with sounds that don’t exist in Japanese like the half sound [m] and [l] in the word ‘contemporary’ (category 2) needed to be memorized because the score did not change much; it was 55 and 58 in ‘A’ and ‘A1’ respectively. Other words for which pronouncing did not make a big impact were, ‘restaurant’ (category 1), ‘church’ (category 7), ‘communication’ (category 8) and ‘pronunciation’ (category 9) (Fig. 1A, A1).



A (Day1): Teacher pronounced the word  
A1 (Day2): Teacher pronounced the word and students repeated before writing the spelling  
B and C (Day 1): Student pronounced the word

Fig. 1 Number of correctly spelled words according to word list

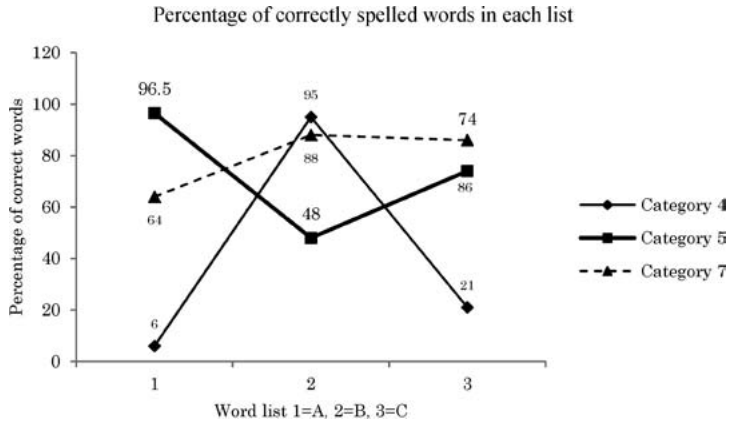


Fig. 2 Percentage of all 3 correctly spelled words belonging to top 3 categories

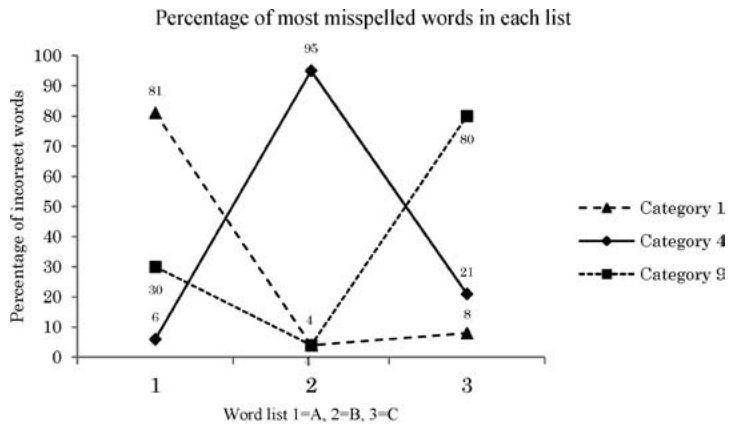


Fig. 3 Percentage of all 3 misspelled words belonging to top 3 categories

#### IV. Conclusion

In this investigation, 10 categories of words were selected to specifically examine whether students could correctly spell words prone to be misspelled in one or more ways. Most students who could distinguish the difference after pronouncing the word, were closer to spelling it correctly the second time. What

is the best method to remember spelling of words if accurate pronunciation does not help? As mentioned earlier, pronouncing in a way that represents all spellings is a method that is also supported by Drake and Ehri (1984). Avery and Ehrlich (1992) point out that since Japanese has a five-vowel system, Japanese learners of English must learn to make many new vowel distinctions by practicing minimal pairs for example: seat and sheet, tick and chick, which may help distinguish resembling words.

According to Ehri (2000), spellers may need to invoke other special strategies to perfect their spelling ability. Such words require word-specific memory. Although word-specific knowledge is considered important, it is mentioned that, if spellers are taught about additional ways in which alphabetic system is regular, it should reduce the number of words requiring special strategies to remember. On the other hand, as Yavas (2006) pointed out, irregularity of English spelling is confusing for pronunciation and spelling. For example, the same phonemes can be represented by different letters ([i] in each, either, scene); the same letter may represent different phonemes (a in gate, any, father, above), and phonemes may be represented by a combination of letters (th for [θ] or [ð] as in thin and this respectively, gh for [f] as in enough); some isolated irregularities, as m is silent in mnemonic, n is silent in autumn, and d is silent in handsome, sandwich; the single and double occurrence of one letter, some combinations of consonant letters, with the following phoneme correspondences: ph [f] phoneme (/p/ + /h/ in successive syllables); two-consonant letter combinations have two different values: ch [tʃ] change, [k] character. In the above cases, like Ehri & Wilce, (1982) mentioned, to remember letters that do not symbolize sounds, readers may have to flag them in memory.

The spellings retained in memory are visual forms made up of letter sequences, which are referred to as orthographic images (Ehri, 1980). However their route into memory is not a matter of memorizing strictly visual infor-

mation as one might remember people's faces. Rather, the route is primarily alphabetic. Most letters are remembered because they confirm to the speller's knowledge of grapho-phonemic connections or spelling patterns.

Word-specific knowledge retained from seeing words in print while reading helps poor spellers who don't develop to skilled readers (Ehri, 2000). Many studies have proved that reading and spelling are correlated but it takes more memory to spell perfectly than pronounce accurately. Cronnell (1978) reported that there are about 40 distinctive phonemes in English, but there are about 70 letters or letter combinations to symbolize phonemes which make pronouncing spellings easier than writing spellings.

The importance of spelling must not be underestimated because it is a prerequisite that written words are correctly spelled before English text becomes legible. Spelling instruction must remain as an important goal of teachers and schools and key to effective instruction is integrating close articulation between reading and writing so that their acquisition is mutually facilitative and reciprocal (Ehri, 2000).

For learners of English as a second language, to spell words with sounds that don't exist in their native language could be a serious challenge. The purpose of this investigation was to find whether learning accurate pronunciation can help lead to correct spelling, or other factors like word familiarity and memory are important. When students were asked to write spellings of words in list 'A' according to teacher's pronunciation, the number of correctly spelled words were lower than when hearing the pronunciation of fellow students. This result shows that being used to how a word is heard is important to recognize the word and its meaning so it could lead to correct spelling. Although the students were familiar with the word and knew the spelling, hearing its pronunciation from the teacher was confusing for students so they took it for a different word. Finally, spelling of words in list 'A' was re-written after pronouncing the

word after the teacher. Results show that though it had a positive effect on all categories of words, doing this activity had less impact on some categories than others. Therefore, word-specific memory and using special strategies mentioned above by previous studies are recommended.

Oneway to understand the origin of mistakes may lie in knowing that Japanese Kanji is written in a definite stroke order but it may have multiple ways of pronouncing. For words borrowed from other languages, Roman character is used to break the original pronunciation to complete syllables for example, Japanese pronounce “design” as [de + za + i + n ] not [de + sign].

In English, alphabets are written in a determined sequence but there is only one way to pronounce it although sometimes, sounds that are not represented in writing may be included in the pronunciation for example, ‘thousand’ and ‘present’ are written with an ‘s’ although pronounced [z].

In this investigation, we tested the students’ ability to spell words after hearing and repeating the pronunciation. For many students although they were familiar with the word, they could not spell it because the pronunciation deviates so much in Katakana that they might not be able to recognize or identify the word. Pronunciation by 1) the teacher, 2) the fellow student and 3) the spell-er himself/herself were tested and it proved that accurate pronunciation is useful to remember the spelling of certain categories of words but not all categories. Further studies are required to test students’ spelling ability involving only pictures and no pronunciation. That way, students will need to know what the item in the picture is called in English and be able to spell it correctly. It may help to pinpoint how each student assigns his/her own pronunciation to words when they know its meaning. This way, word familiarity would not be a shortcoming.

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